GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	3D prototyping, PG_00069746		
Field of study	Nanotechnology		
Date of commencement of studies	February 2025	Academic year of realisation of subject	2025/2026
Education level	second-cycle studies	Subject group	Specialty subject group Subject group related to scientific research in the field of study
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	Polish
Semester of study	2	ECTS credits	4.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Institute of Nanotechnology and Materials Engineering -> Faculty of Applied Physics and Mathematics -> Wydziały Politechniki Gdańskiej		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Marek Chmielewski	
	Teachers		

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	0.0	30.0	0.0	45

E-learning hours included: 0.0

Learning activity and number of study hours

Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM
Number of study hours	45	5.0	50.0	100

Subject objectives

The aim of the course is to familiarize the student with the possibilities of technical 3D prototyping from the level of using commercial and non-commercial software to create 3D models to the process of direct printing using 3D devices such as FDM/FFF and SLA.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_W06] Has extended knowledge on the methodology of physics laboratory work, supported with experience in laboratory work. Knows the rules of occupational health and safetyto a degree sufficient for independent work at a research and measuring position.	Students will learn about the structure and operation of equipment used in materials research in physics laboratories, particularly in the field of nanotechnology. They will understand the significance of conducting experiments in the correct way. They will be able to safely prepare the experimental space while ensuring the correct quality of the results obtained.	[SW1] Assessment of factual knowledge
[K7_W01] has extended and organized knowledge of materials science.	The student is able to apply the right material to a specific task in any project. They can effectively model the properties of the material and indicate the technique to be used to obtain it. They are familiar with the limitations of modelling materials that can be used in 3D prototyping technology.	[SW1] Assessment of factual knowledge
[K7_U06] can plan and conduct theoretical and numerical calculations, simulations of phenomena and processes, critically analyze their results, draw conclusions and formulate reasoned conclusions – within their specialization.	Students will learn the way to analyse and verify the correctness of a planned experiment, and will be able to apply simulation and modelling techniques to verify the quality of the results obtained. They will learn complementary techniques that can be applied to confirm their results and the conclusions drawn from their analysis.	[SU1] Assessment of task fulfilment [SU3] Assessment of ability to use knowledge gained from the subject

<table>
<tr><td>Subject contents</td><td>The content of the course is to comprehensively familiarise students with prototyping techniques based on 3D printing technologies. Within the scope of the subject, programmes for the rapid creation of simple and advanced 3D models will be presented. Work with commercial as well as free software is foreseen. The next task will be to familiarise students with 3D printing techniques, especially in terms of practical applications. The final stage of the course will be the realisation of a selected 3D project, from the level of the computer model to the final product.

The project will involve 3D prototyping tasks to apply FDM/FFF and SLA printing techniques.

At least three projects are planned to be carried out as part of the classes.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>not required</td></tr>
<tr><td>Assessment methods and criteria</td><td><table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>project</td><td>80.0%</td><td>100.0%</td></tr></table></td></tr>
<tr><td>Recommended reading</td><td><table><tr><td>Basic literature</td><td>web resources

https://3d.edu.pl/3-obowiazkowe-ksiazki-o-druku-3d/</td></tr><tr><td>Supplementary literature</td><td>not require</td></tr><tr><td>eResources addresses</td><td></td></tr></table></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>FPD/FFF printing technology

Filaments PLA,ABS,PET

Ekstruders, hot end.</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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